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| 09/737,783 | 12/15/2000 | Perry Wang | 42390P9634 | 2478 |

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10/22/2003

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EXAMINER

HARKNESS, CHARLES A

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 10/22/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/737,783

Applicant(s)

WANG ET AL

Examiner

Charles A Harkness

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Papers Submitted

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Revised Declaration as received on 04/23/01; and Information Disclosure Statement as received on 06/06/01; and Drawings as received on 06/21/01.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
3. The applicant or their representatives are urged to review the specification and submit corrections for all mistakes of a grammatical, clerical, or typographical nature.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Gschwind et al, U.S. Patent Number 6,513,109 (herein referred to as Gschwind).
5. Referring to claim 1 Gschwind has taught a microprocessor comprising:
- a plurality of dynamic pipeline stages including at least one predicated instruction wherein the predicated instruction includes a plurality of guarding predicates (Gschwind column 2 lines 64-67, figures 2-3, column 16 lines 8-11);

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a register renaming unit (Gschwind figure 4 number 330);
a reorder buffer (Gschwind column 9 lines 55-58);
a plurality of execution units (Gschwind figure 4 numbers 340, 345, 350);
a plurality of reservation stations wherein the register renaming unit, the reorder buffer, the plurality of execution units and the plurality of reservation stations are coupled to at least one of the plurality of dynamic pipeline stages (Gschwind figure 4 number 335); and
an augmented register alias table (Gschwind column 10 lines 5-7, figure 10).

6. Referring to claim 2 Gschwind has taught wherein the register renaming unit renames each one of a plurality of source registers of the pipeline instruction and renames a destination register to a new physical register (Gschwind column 8 lines 25-43 figure 10).

7. Referring to claim 3 Gschwind has taught wherein the augmented register alias table includes a plurality of lines, and wherein each one of the plurality of lines includes a plurality of renamed destination registers (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

8. Referring to claim 4 Gschwind has taught wherein each one of a plurality of select-uops has a plurality of source operands wherein each one of the plurality of source operands corresponds to a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

9. Referring to claim 5 Gschwind has taught wherein the plurality of source operands comprises a first source operand and a plurality of secondary source operands (Gschwind figure 10, the architected register names, and the future register names, column 9 line 65-column 10 line 32).

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10. Referring to claim 6 Gschwind has taught wherein the first source operand includes a default physical register identifier, wherein the default physical register is always valid and available (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register and is used for all predicate instructions and its always available).

11. Referring to claim 7 Gschwind has taught wherein each one of the plurality of secondary source operands includes a plurality of status bits and a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 22 lines 32-39).

12. Referring to claim 8 Gschwind has taught wherein each one of the plurality status bits has a ready bit and a committed bit (Gschwind column 17 lines 61-67, column 21 lines 7-12).

13. Referring to claim 9 Gschwind has taught a method of processing predicated instructions comprising:

receiving a plurality of predicated instructions assigned to a common defined destination register (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register) and wherein at least one of the plurality of predicated instructions is out of order in an dynamic pipeline (Gschwind column 9 lines 55-58);

renaming the destination register for each one of the plurality of predicated instructions (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32);

assigning the corresponding renamed destination register for each one of the plurality of predicated instructions with a corresponding predicate register to corresponding ones of the a plurality of source operands of a select-uop (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32);

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determining a valid predicate in the source operands of the select-uop(column 22 lines 32-39, column 15 line 66-column 16 line 7);

selecting the register corresponding to the select-uop that corresponds to the valid predicate (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 15 line 66-column 16 line 7);

transferring the data in the selected register to the destination register (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32); and

executing a consumer instruction wherein the consumer instruction uses the data from the destination register of the corresponding select-uop (Gschwind column 14 lines 19-26).

14. Referring to claim 10 Gschwind has taught wherein the each one of the plurality of select-pops has a plurality of source operands wherein each one of the plurality of source operands corresponds to a physical register identifier (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

15. Referring to claim 11 Gschwind has taught wherein the plurality of source operands comprises a first source operand and a plurality of secondary source operands (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

16. Referring to claim 12 Gschwind has taught wherein the first source operand includes a default physical register identifier, wherein the default physical register is always valid and available (Gschwind column 15 lines 48-65, column 14 line 46-column 15 line 28; the predicate register is a common register and is used for all predicate instructions and its always available).

17. Referring to claim 13 Gschwind has taught wherein each one of the plurality of secondary source operands includes a plurality of status bits and a physical register identifier

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(Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32, column 22 lines 32-39).

18. Referring to claim 14 Gschwind has taught a computer system comprising:

a processor, wherein the processor includes:

a plurality of dynamic pipeline stages including at least one predicated instruction

wherein the predicated instruction includes a plurality of guarding predicates (Gschwind column 2 lines 64-67, figures 2-3, column 16 lines 8-11);

a register renaming unit (Gschwind figure 4 number 330);

a reorder buffer (Gschwind column 9 lines 55-58);

a plurality of execution units (Gschwind figure 4 numbers 340, 345, 350);

a plurality of reservation stations wherein the register renaming unit, the reorder buffer, the plurality of execution units and the plurality of reservation stations are coupled to at least one of the plurality of dynamic pipeline stages (Gschwind figure 4 number 335); and

an augmented register alias table (Gschwind column 10 lines 5-7);

a system bus (Gschwind figure 4 the system bus would be the bus between the memory 305 and the cache systems);

a computer memory system (Gschwind 4 number 305);

an input/output device (Gschwind figure 4; most of the logical units are input and output devices, including the memory 305 and the data cache, the future register file, the execution units);

wherein the system bus is coupled to the processor, the computer memory system and the input/output device.

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19. Referring to claim 15 Gschwind has taught wherein, the augmented register alias table includes a plurality of lines, and wherein each one of the plurality of lines includes a plurality of renamed destination registers (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

20. Referring to claim 16 Gschwind has taught wherein, the register renaming unit renames each one of the plurality of source registers of the pipeline instruction and renames the destination register to a new physical register (Gschwind figures 10-11, column 8 lines 25-43, column 9 line 65-column 10 line 32).

Conclusion

21 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR 1.111(c).

Morrison U.S. Patent Number 6,170,052 has taught a method and apparatus for implementing predicated sequences in a processing with renaming.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles A Harkness whose telephone number is 703-305-7579. The examiner can normally be reached on 8:00 A.M. – 5:30 P.M. with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 703-305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-7579.

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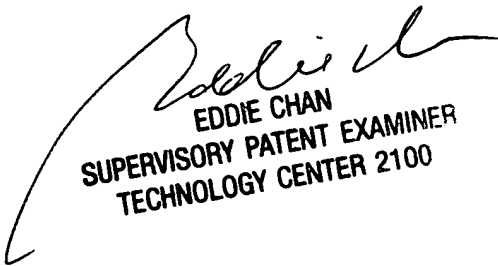
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Charles Allen Harkness

Examiner

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October 15, 2003



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